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ABSTRACT

According to Jaan Valsiner, development takes place within culturally structured environments jointly organized by the activities of children and the people around them. When overlap between promoted activity and the child's zone of proximal development exists, the structure of action that results from the interplay of the two is internalized by the child. This internalization constitutes development. Valsiner's perspective expands on Piaget's portrayal of structural genesis and change. Specifically, disequilibration may be considered as the result of asymmetries between the child's endogenous action structures and the exogenous, microgenetic (that is, occuring between the child and its environment) structures organized between the child and more capable individuals. Disequilibration, therefore, may be socially induced. Furthermore, it may be expressed in the child's sensorimotor and affective actions. These actions signal to others about need states. Caregivers may reorganize microgenetic transactions in ways that regulate the disequilibration. It is proposed, in contrast to Piaget, that the affective system, in addition to regulating the functioning of intellectual structures, may also modify the microgenetic structures that are internalized over time. This position is illustrated in a report of empirical observations of a 25-week-old girl who was videotaped for 12 weeks after she became interested in exploring and moving on and around a step which was located between two floor levels in her home. (RH)

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Social Contributions to the Equilibration of Action Schemes: A Longitudinal Study of Locomotion

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The work I will be presenting represents an attempt to place the development of locomotion in a social context, and in doing so, reveal something about the role of affect in sensorimotor development. It focuses on an infant who became able to locomote over a 5-inch step that separated two rooms of her home, but who then became fearful of locomoting over it. The question I wanted to answer was this: How did the parent and child organize each other's activities so as to make the child's locomotions possible?

Before I go into the details of the study, I would like to tell you a story about a fish -- a father jewel fish -- who lived in Konrad Lorenz's laboratory. Jewel fish fathers participate actively in family life. For example, they are charged with putting their young to bed. To accomplish this, the father inhales each youth into his large mouth, swims to the nest, and blows the baby into the nesting hollow. One evening the fish were fed later than usual, and the father was already busy transporting children. Lorenz wrote of an astonishing event:

> As I approached the container, I saw that most of the young were already in the nesting hollow over which the mother was hovering. She refused to come for the food when I threw pieces of earthworm into the tank. The father, however, who, in great excitement, was dashing backwards and forwards searching for truants, allowed himself to be diverted from his duty by a nice hind-end of earthworm. He swam up and seized the worm, but owing to its size, was unable to swallow it. As

> he was in the act of chewing this mouthful, he saw a baby fish swimming by itself across the tank; he raced after the baby and took it into his already filled mouth. It was a thrilling moment. The fish had in its mouth two different things of which one must go into the stomach and the other into the nest. What would he do? If ever I have seen a fish <u>think</u>, it was in that moment! What a truly remarkable thing that a fish can find itself in a genuine conflicting situation.... it stops, blocked in all directions, and can go neither forward nor backward... one could almost see how his <u>feelings</u> were working.

I was intrigued by Lorenz's observation. Not so much by its phylogenetic significance, but by Lorenz's allusion to the simultaneous activity of thoughts and feelings during this conflicting situation. Developmental psychologists are becoming increasingly attuned to the fact that behavior is multiply determined. Cognition and affect, for example, are intertwined in ways that we are just beginning to understand. The possibility that relationships between them may be more visible during periods of conflict, or disequilibration, is where my story begins.

We are all well acquainted with Piaget's position on disequilibration: it is development's motor. It is therefore surprising that we rarely study it directly. We have some ideas about its origin -- asymmetries between individual competencies and

environmental demands; and we have ideas about its outcome -- more inclusive levels of structural adaptation. Nonetheless, we are ill-informed of the transformational process itself, and how it might be manifested in child-environment transactions.

Piaget would agree that the transformation of sensorimotor schemes, at least, may be apparent in interactions between children and their environments. He has described an example in which a baby attempts to draw a long object horizontally between the vertical bars of a crib. There is an asymmetry between the structure of the child's action, and the attributes of the object the child is attempting to assimilate. The bars present an obstacle to goal attainment, and lead to disequilibration. This is experienced as need. At the level of sensorimotor intelligence, all actions that lead to re-equilibration serve to overcome such obstacles. Here, and in other descriptions of sensorimotor disequilibria, Piaget made explicit reference to the simultaneous activity of affect and intelligence. But when he elaborated on the relationships between these two systems, he focused on periods of equilibration, and characterized them in terms of their stage-like properties.

Piaget began his analysis of the two systems by describing their functional interdependence and dialectical coordination. An important distinction between them is that cognitive functions are closed and structured, whereas affective functions are open and energetic. Cognitive systems may be affectively regulated, but not affectively generated or modified.

Both systems were considered to develop in the course of ontogeny, and Piaget argued for examining cognitive structures and affective functions that are contemporaneously present at particular points in the life history of the individual. He wrote of a term-by-term, stage-by-stage correspondence between them. During the latter part of the sensorimotor stage, the child becomes able to distinguish between means and ends; the means for acheiving particular goals become differentiated from the goals themselves. This is a cognitive acheivement. On the affective plane, the child begins to form a heirarchy of values with respect to goal attainment. Actions and objects are appraised according to how well they satisfy particular needs, and as a consequence, are conferred with value. The value hierarchy, however, is also a cognitive acheivement, as it results from an intellectualization of the affective system.

I would argue that Piaget's structure-energetic distinction, particularly his claim that the affective system lacks structure and is incapable of modifying or transforming intellectual structures, is erroneous. Piaget was lead to this conclusion as a consequence of emphasizing child activity abstracted from socially structured environments. I would like to talk about another persepctive, developed by Jaan Valsiner, that incorporates Piagetian and Vygotskian ideas, and accords an active role to the social environment in organizing the child's actions within it.

Valsiner's theoretical system is premised on the idea that development takes place within culturally structured environments

jointly organized by the activities of children and the people around them. Structured activity takes place at two levels. The first is microgenetic, that is, between the child and the environment. Individuals in the child's life are thought to organize and re-organize the child's microgenetic interchanges according to culturally given systems of meaning. These individuals promote certain activities, and constrain others. The microgenetic activity promoted by others attains ontogenetic significance according to the child's zone of proximal development (ZPD). When there is an overlap between promoted activity and the child's ZPD, the structure of action that results from the interplay of the two is internalized by the child. This constitutes development. Exogeneous microgenetic structures become internalized ontogenetic structures.

This perspective expands on Piaget's portrayal of structural genesis and change. Specifically, disequilibration may be considered the result of asymmetries between the child's endogeneous action structures and the exogeneous, microgenetic structures organized between the child and more capable individuals. Disequilibration, therefore, may be socially induced. Furthermore, it may be expressed in the child's sensorimotor and affective actions. These actions function to signal others about need states, or in other words, the overlap between promoted action and the ZPD. The caregiver may then re-organized microgenetic transactions in ways that regulate the disequilibration -- by removing the particular obstacle, assisting in goal attainment, or by changing the child's goal entirely. In

contrast to Piaget's position, the affective system not only regulates the functioning of intellectual structures, it may also modify the microgenetic structures that are internalized over time. This is illustrated in the empirical material I will now present.

The child was videotaped at weekly or biweekly intervals as she explored and locomoted on and around the step. Videotaping began when she was 25 weeks of age, at which time she began to express interest in the step, and continued until she was 38 weeks of age. Four distinct phases were identified over the 12 week period. During the first phase (25-29 weeks) the child first acquired the ability to locomote over the step. This was followed by two weeks of independent locomotion. The third phase (33-37 weeks) was marked by distress and refusals to climb down the step unless provided with physical assistance. After several weeks, she was again able to locomote up and down the step without assistance.

The analysis focused on the acquisition phase and the distress and refusal phase. It took the form of specifying, in qualitative terms, transformations to parent and child goal structures.

Figure 1 illustrates what took place during the early part of the acquisition phase. (The figures are reconstructions of single frames of sequences observed during the study). The child was interested in the step as a goal object, rather than as a means to goal attainment. She would explore it by patting the floor on either side of the step edge, would chew on it, --- things of that nature. The parent

maintained physical contact at all times during these explorations. For both parent and child, the step was treated as a goal object, and not yet as a means to goal attainment.

In the latter part of the acquisition phase, the parent promoted development from step-as-goal to step-as-means-to-goal. This was usually accomplished by diverting the child's attention from the step itself, as shown in Figure 1, to a toy, as shown in Figure 2. The child's locomotor attempts were encouraged, and we see in Figure 3 that the parent would physically assist the child in reaching the object.

It was only toward the end of the acquisition phase, just prior to the phase of independent locomotion, that the child indicated that she perceived the step as a means to goal attainment. This was expressed in her reluctance to locomote over the step unless she had some degree of control over the conditions of assistance. Figure 4 shows her reaching over the step to use the parent as a bridge between the two floor levels. Notice that the parent continues to provide the same physical assistance that she had provided earlier. Figure 5 shows how the parent promoted these efforts by moving closer to the step so the child could use her as an intermediate level.

Comparatively, goal structure transformations during the distress and refusal phase took a different form. First of all, the child's activities at the step were not constrained -- the parent did not automatically provide physical assistance. This was probably due to the parent's knowledge that the child possessed the sensorimotor

abilities required to safely traverse the step. Secondly, the structure of action promoted by the parent is different here. Remember that during the acquisition phase she redirected the child's interest from the step itself to a toy. In contrast, during this phase, she acted to maintain the child's initial interest in a toy, and then restructured the setting so that the child had to locomote over the step to get it. This is illustrated in Figure 6.

During one observation, there were several cycles of this. The child was sitting on top of the step playing with a toy. The mother took it away and used it to entice the child over the step. The child then got a different toy. Again the mother took it away and used it to encourage locomotion. The child got a third toy which the mother also took away. Finally, the child sat at the step edge, waved her arms and vocalized in distress. The mother moved closer to the step and the child climbed down, using her as a bridge.

During both the acquisition phase and the distress and refusal phase, the child's affective and sensorimotor actions provided the parent with clues to the process of disequilibration --- the state of overlap between promoted action and the child's zone of proximal development. Disequilibration was therefore accomplished and regulated through the medium of social transaction. Development during the acquisition phase may be interpreted within Piaget's framework: The step took on value as a means in the context of satisfying a 'need' (i.e. in leading to goal attainment). However, it was the parent who created the "need" by re-organizing microgenetic

transactions and canalizing the child's interest from step-as-goal to step-as-means-to-goal. Likewise, during the distress and refusal phase, the parent organized transactions so as to encourage the child to use the step as a means for acquiring particular goals.

In the course of examining the social induction and regulation of disequilibration, we are given a glimpse of the child-environment relationship as a co-constructed totality. This allows us to move beyond that legacy of science which has produced, in the words of Engels, "the habit to observing natural objects and natural processes in their isolation,..., and therefore not in their motion, but in their repose" (1966, p. 27). Developmental psychologists are concerned with understanding ontogenetic motion. I hope I have convinced you that we have the theoretical and methodological tools for doing so.

Figure 1

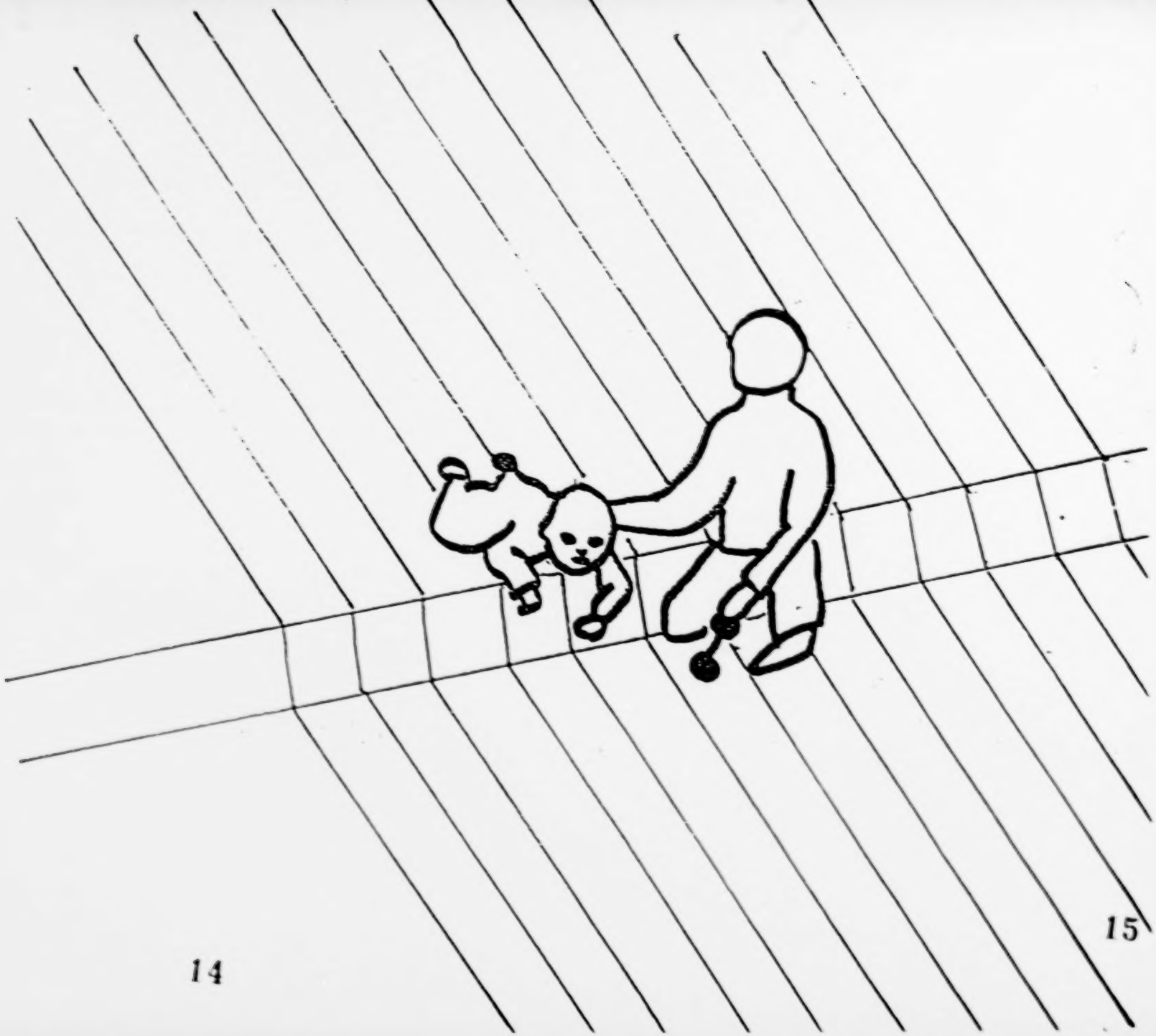

Figure 2

Figure 3

Figure 4

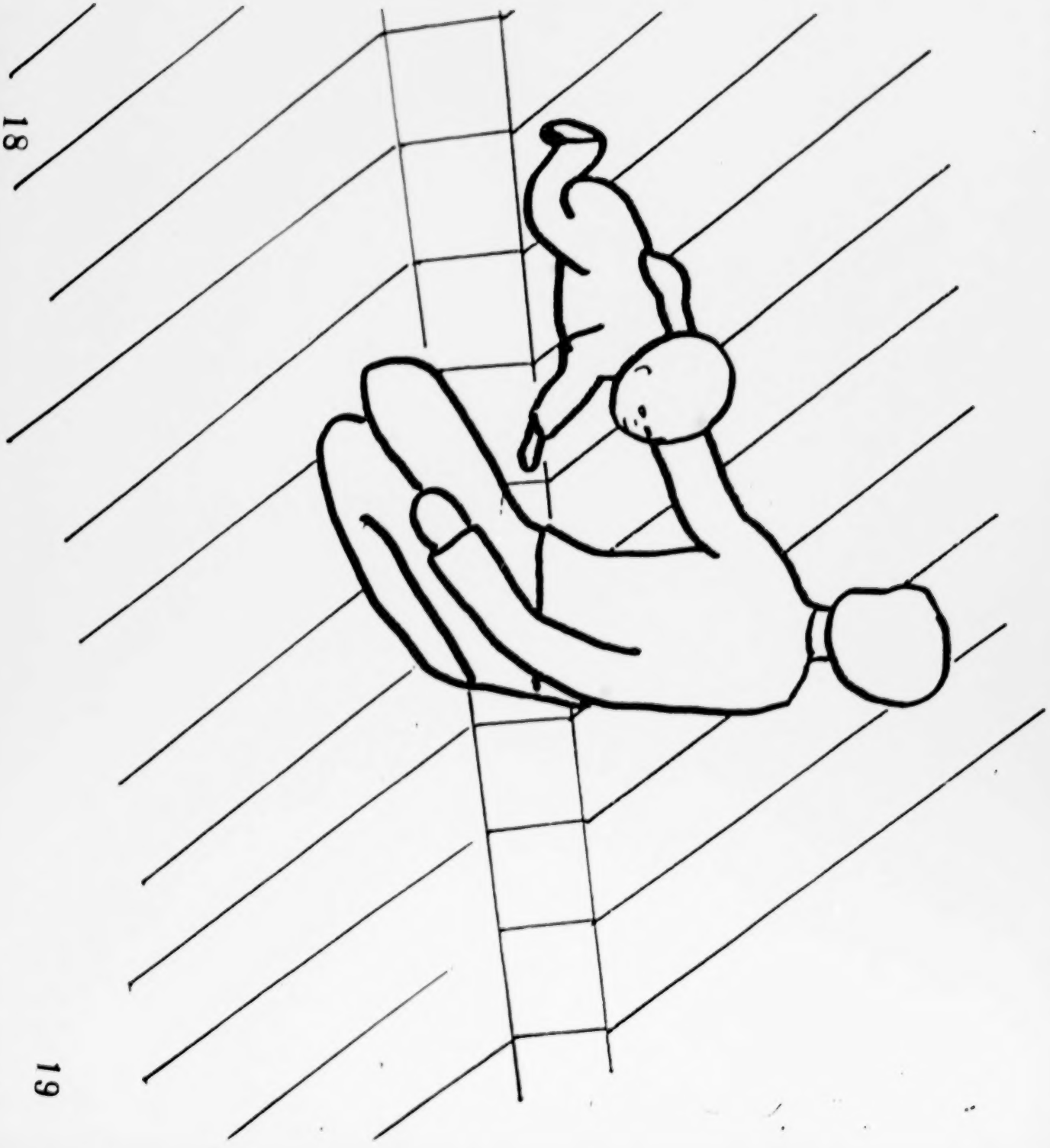

Figure 5

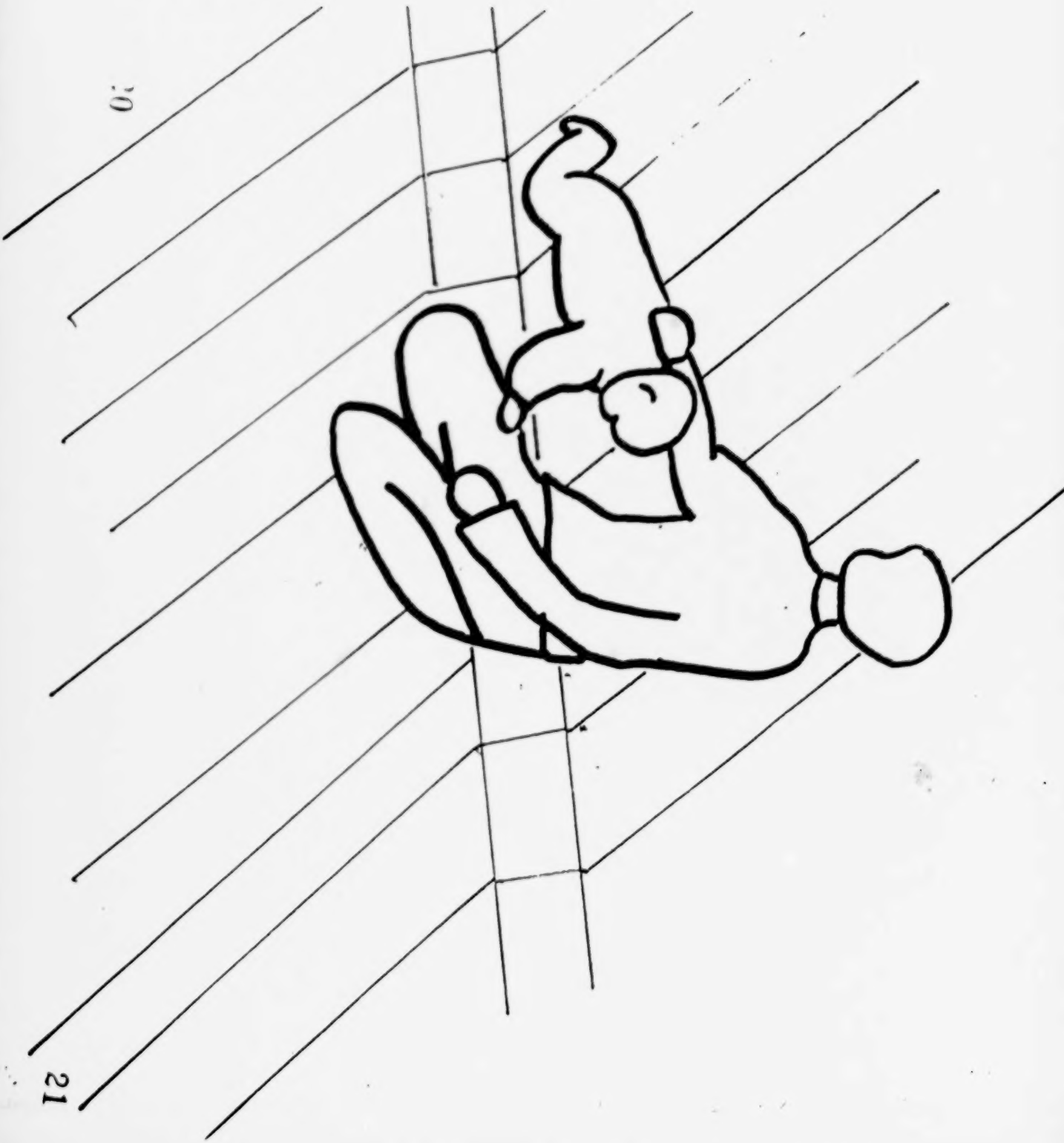

Figure 6